

CLAIMS

1. A method for mobile communication, comprising:
 - arranging a plurality of access points in a wireless local area network (WLAN) to communicate over the air with a mobile station using a common basic service set identification (BSSID) for all the access points;
 - receiving at one or more of the access points an uplink signal transmitted over the WLAN by the mobile station using the common BSSID;
 - sending and receiving messages over a communication medium linking the access points in order to select one of the access points to respond to the uplink signal; and
 - transmitting a response from the selected one of the access points to the mobile station.
2. The method according to claim 1, wherein the access points are configured to communicate with the mobile station over a common frequency channel shared by all the access points.
3. The method according to claim 2, wherein the access points have respective service areas, and wherein arranging the plurality of the access points comprises arranging the access points so that the service areas substantially overlap.
4. The method according to claim 1, wherein arranging the plurality of the access points comprises arranging the access points to communicate with the mobile station substantially in accordance with IEEE Standard 802.11.
5. The method according to claim 1, wherein arranging the plurality of the access points comprises assigning a respective medium access control (MAC) address to each of

the access points, so that each of the access points ignores uplink data messages that are not addressed to the respective MAC address.

6. The method according to claim 5, wherein arranging the plurality of the access points comprises configuring the access points to emulate mobile station communications, so that each of the access points acknowledges the uplink data messages that are addressed from the mobile station to the respective MAC address.

7. The method according to claim 6, wherein sending and receiving the messages comprises reconfiguring the selected one of the access points temporarily to stop emulating the mobile station communications, so as to transmit an acknowledgment to a management frame transmitted by the mobile station.

8. The method according to claim 6, wherein sending and receiving the messages comprises changing the respective MAC address of the selected one of the access points temporarily, so as to cause the selected one of the access points to transmit an acknowledgment to a management frame transmitted by the mobile station.

9. The method according to claim 5, wherein transmitting the response comprises instructing the mobile station to transmit all the uplink data messages to the respective MAC address of the selected one of the access points.

10. The method according to claim 9, wherein instructing the mobile station comprises sending an Address Resolution Protocol (ARP) response to the mobile station.

11. The method according to claim 10, and comprising, subsequently to transmitting the response from the selected one of the access points, and responsively to a further uplink signal received from the mobile station, selecting a further one of the access points to communicate with the mobile station, and sending a spoofed ARP response to the mobile station instructing the mobile station to transmit all further uplink data messages to the respective MAC address of the further one of the access points.
12. The method according to claim 1, wherein receiving the uplink signal comprises measuring a strength of the uplink signal at each of the one or more of the access points, and wherein sending and receiving the messages comprises indicating in the messages the measured strength of the uplink signal, and selecting the one of the access points to respond to the uplink signal responsively to the strength indicated in the messages.
13. The method according to claim 12, wherein measuring the strength comprises measuring the strength repeatedly in response to subsequent uplink signals transmitted by the mobile station, and wherein selecting the one of the access points comprises selecting a different one of the access points to respond to the subsequent uplink signals, responsively to a change in the measured strength.
14. The method according to claim 1, wherein sending and receiving the messages comprises sending the messages from the access points to a manager node, which processes the messages so as to select the one of the access points to respond to the uplink signal, and sending instructions

from the manager node to the selected one of the access points to transmit the response.

15. A method for mobile communication, comprising:

arranging a plurality of access points in a wireless local area network (WLAN) to communicate over the air on a common frequency channel with a mobile station;

receiving at one or more of the access points an uplink signal transmitted over the WLAN by the mobile station on the common frequency channel;

conveying messages responsively to the uplink signal from the one or more of the access points over a communication medium linking the access points to a manager node;

processing the messages at the manager node so as to select one of the access points to respond to the uplink signal; and

transmitting a response from the selected one of the access points to the mobile station.

16. The method according to claim 15, wherein the access points have respective service areas, and wherein arranging the plurality of the access points comprises arranging the access points so that the service areas substantially overlap.

17. The method according to claim 15, wherein arranging the plurality of the access points comprises arranging the access points to communicate with the mobile station substantially in accordance with IEEE Standard 802.11.

18. The method according to claim 15, wherein arranging the plurality of the access points comprises assigning a respective medium access control (MAC) address to each of the access points, so that each of the access points

acknowledges uplink data messages addressed from the mobile station to the respective MAC address.

19. The method according to claim 18, wherein arranging the access points to communicate comprises configuring the access points to emulate mobile station communications, so that each of the access points ignores the uplink data messages that are not addressed to the respective MAC address.

20. The method according to claim 19, wherein transmitting the response comprises instructing the selected one of the access points temporarily to stop emulating the mobile station communications, so as to transmit an acknowledgment to a management frame transmitted by the mobile station.

21. The method according to claim 19, wherein transmitting the response comprises changing the respective MAC address of the selected one of the access points temporarily, so as to cause the selected one of the access points to transmit an acknowledgment to a management frame transmitted by the mobile station.

22. The method according to claim 18, wherein transmitting the response comprises instructing the mobile station to transmit all the uplink data messages to the respective MAC address of the selected one of the access points.

23. The method according to claim 22, wherein instructing the mobile station comprises sending an Address Resolution Protocol (ARP) response to the mobile station.

24. The method according to claim 23, and comprising, subsequently to transmitting the response from the selected one of the access points, and responsively to a further uplink signal received from the mobile station, selecting a further one of the access points to communicate with the mobile station, and sending a spoofed ARP response to the mobile station instructing the mobile station to transmit all further uplink data messages to the respective MAC address of the further one of the access points.

25. The method according to claim 15, wherein receiving the uplink signal comprises measuring a strength of the uplink signal at each of the one or more of the access points, and wherein conveying the messages comprises indicating in the messages the measured strength of the uplink signal, and wherein processing the messages comprises selecting the one of the access points to respond to the uplink signal responsively to the strength indicated in the messages.

26. The method according to claim 25, wherein measuring the strength comprises measuring the strength repeatedly in response to subsequent uplink signals transmitted by the mobile station, and wherein selecting the one of the access points comprises selecting a different one of the access points to respond to the subsequent uplink signals, responsively to a change in the measured strength.

27. The method according to claim 15, wherein arranging the plurality of the access points comprises assigning all the access points to the same basic service set (BSS).

28. The method according to claim 15, wherein the manager node comprises a plurality of management processors.
29. The method according to claim 28, wherein the plurality of management processors comprises a control processor and a packet processor, and wherein processing the messages comprises selecting the one of the access points to respond to the uplink signal using the control processor, and further comprises processing uplink data packets received by the selected one of the access points using the packet processor.
30. The method according to claim 29, wherein processing the uplink data packets comprises decrypting the uplink data packets and encrypting downlink data packets at the packet processor, for transmission by the selected one of the access points.
31. The method according to claim 28, wherein processing the messages comprises distributing the messages for processing among the plurality of the management processors.
32. Apparatus for mobile communication, comprising:
a plurality of access points, which are arranged in a wireless local area network (WLAN) to communicate over the air on a common frequency channel with a mobile station using a common basic service set identification (BSSID) for all the access points, and which are adapted, upon receiving at one or more of the access points an uplink signal transmitted over the WLAN by the mobile station on the common frequency channel, to convey messages responsively to the uplink signal from the one

or more of the access points over a communication medium linking the access points; and

a manager node, linked to the communication medium, which is adapted to process the messages so as to select one of the access points to respond to the uplink signal, and to instruct the selected one of the access points to transmit a response to the mobile station.

33. The apparatus according to claim 32, wherein the access points have respective service areas, and are arranged so that the service areas substantially overlap.

34. The apparatus according to claim 32, wherein the access points are configured to communicate with the mobile station substantially in accordance with IEEE Standard 802.11.

35. The apparatus according to claim 32, wherein each of the access points is assigned a respective medium access control (MAC) address, so that each of the access points ignores uplink data messages that are not addressed to the respective MAC address.

36. The apparatus according to claim 35, wherein the access points are configured to emulate mobile station communications, so that each of the access points acknowledges the uplink data messages that are addressed from the mobile station to the respective MAC address.

37. The apparatus according to claim 36, wherein the manager node is adapted to instruct the selected one of the access points temporarily to stop emulating the mobile station communications, so as to transmit an acknowledgment to a management frame transmitted by the mobile station.

38. The apparatus according to claim 36, wherein the manager node is adapted to temporarily change the respective MAC address of the selected one of the access points, so as to cause the selected one of the access points to transmit an acknowledgment to a management frame transmitted by the mobile station.

39. The apparatus according to claim 35, wherein the selected one of the access points is adapted, under control of the manager node, to instruct the mobile station to transmit all the uplink data messages to the respective MAC address of the selected one of the access points.

40. The apparatus according to claim 39, wherein the selected one of the access points is adapted to instruct the mobile station to transmit all the uplink data messages to a given MAC address by sending an Address Resolution Protocol (ARP) response to the mobile station.

41. The apparatus according to claim 40, wherein the manager node is adapted, subsequently to transmission of the response to the mobile station, and responsively to a further uplink signal received from the mobile station, to select a further one of the access points to communicate with the mobile station, and to cause the selected one of the access points to transmit a spoofed ARP response to the mobile station instructing the mobile station to transmit all further uplink data messages to the respective MAC address of the further one of the access points.

42. The apparatus according to claim 32, wherein the access points are adapted to measure a strength of the uplink signal received at each of the one or more of the

access points, and to indicate in the messages conveyed over the communication medium the measured strength of the uplink signal, and wherein the manager node is adapted to select the one of the access points to respond to the uplink signal responsively to the strength indicated in the messages.

43. The apparatus according to claim 42, wherein the access points are adapted to measure the strength repeatedly in response to subsequent uplink signals transmitted by the mobile station, and wherein the manager node is adapted to select a different one of the access points to respond to the subsequent uplink signals, responsively to a change in the measured strength.

44. The apparatus according to claim 32, wherein the manager node comprises a plurality of management processors.

45. The apparatus according to claim 44, wherein the plurality of management processors comprises:

a control processor, which is adapted to select the one of the access points to respond to the uplink signal; and

a packet processor, which is adapted to process uplink data packets received by the selected one of the access points.

46. The apparatus according to claim 45, wherein the packet processor is adapted to decrypt the uplink data packets and to encrypt downlink data packets for transmission by the selected one of the access points.

47. The apparatus according to claim 44, wherein the management processors are adapted to process the messages by distributing the messages among the management processors.